The former is on the windward side of the mountains about 700 feet above the sea and the latter is on the leeward side about 175 feet above the sea. Then again the records of Upper and Lower Canada are worthy of note. Here we have two estates similarly situated, except that one is about 400 feet higher than the other. As a result of this difference in elevation we see a marked and very uniform difference in the monthly and yearly means. See Table 2.

In the year 1899 the prevailing wind for each month in the year was from the east except for December, which was northeast. Or, to state it in another way, the wind was from the east during 54 per cent of the time and from the northeast during 32 per cent of the time. The prevailing winds, together with such other facts as may be gained from this and preceding papers on this subject, prepare the reader for an intelligent appreciation of the agencies which operate in producing and modifying the rainfall on the Island of St. Kitts.

The gages used at these stations were imported from England and appear to be well and scientifically constructed, there being a fixed and uniform ratio between the diameter of the funnel and the diameter of the graduated tube. The measurements are made with great care and regularity, the day, as a rule, is counted from 6 a. m. to 6 a. m., local time.

It only remains to be said with reference to Table 4 that it is the result of an effort to secure some mountain observations and is almost self explanatory. Fountain estate is about 850 feet above sea level and the only available place for such work. The owner, Miss Marshall, kindly consented to do the work if provided with instruments. Accordingly she was equipped with maximum, minimum, and dry thermometers, and these were duly installed on February 14, 1900, and the first observations were made on the following day. The observations were taken on seventy-fifth meridian time and were continued up to and including May 17, 1900. Only two observations were missed during the time. Unfortunately the maximum thermometer was broken at the end of the first week, so that no note is made of the readings of the maximum thermometer except for the one week. The corresponding data on record at this office for precisely the same time are also inserted in the table for the sake of comparison.

The data in Table 5 are fully explained in the foot note, and it only remains to say that the work was done at my request and by responsible parties.

TABLE 1.—*Monthly and yearly means of rainfall within each of the four divisions into which the island is divided.*

Divisions.	No. stations	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	For year.
North end	13	3.35	2.42	1.92	3.63	8.16	4.39	6.41	7.32	8.47	7.39	7.87	5.57	68.51
East side	15	3.00	1.96	1.33	3.12	6.45	3.40	5.01	6.98	7.46	7.31	6.94	4.49	55.28
South end	11	2.95	2.27	1.12	2.08	5.53	3.08	4.59	6.26	6.96	4.82	4.92	4.99	53.12
West side	7	4.18	2.53	1.91	2.30	4.41	3.64	6.07	7.37	6.84	6.66	6.45	5.50	66.10

NOTE.—The first column shows the number of stations upon whose records the means are based.

TABLE 2.—*Monthly and annual means for certain estates which for local causes present interesting points.*

Estates.	No. years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	For year.
Brotherson's	5	4.33	2.69	2.58	4.28	7.42	7.26	8.30	7.86	10.48	7.94	13.52	5.76	85.21
Molyneux	9	3.31	2.29	2.10	4.52	7.12	5.10	5.88	7.30	8.80	8.77	10.31	5.59	71.62
Lower Canada	18	2.47	1.57	1.66	2.56	4.31	3.78	3.94	5.76	5.96	4.91	5.05	3.04	45.01
Upper Canada	18	3.04	1.93	1.94	2.92	4.98	4.51	4.87	6.24	6.82	5.65	5.81	3.59	52.33
Wingfield	21	5.41	4.85	3.79	3.75	4.99	5.15	5.94	8.00	7.43	8.30	7.09	7.14	71.54
Basseterre	44	3.66	1.89	2.07	3.32	4.18	4.00	4.46	5.67	6.45	6.54	5.36	3.76	51.38

NOTE.—The number of years record involved is shown in first column. These estates are located on the accompanying map, fig. 2.

TABLE 3.—*A comparative study of the rainfall on four of the Leeward Islands for the year* 1895.

Islands.	No. stations	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	For year.
Montserrat	1	4.40	1.29	3.13	1.51	5.61	5.77	8.22	12.33	11.20	6.77	10.40	2.57	73.20
Antigua	69	2.30	0.51	1.45	2.30	7.94	1.57	3.65	6.46	7.41	5.13	5.08	8.83	52.91
Nevis	13	3.56	1.29	2.12	1.35	7.67	3.97	3.09	7.49	7.31	5.95	5.00	4.52	53.32
St. Kitts	35	2.66	1.41	1.13	2.00	9.86	2.66	4.82	7.54	8.48	4.94	3.14	6.41	56.61

NOTE.—The number of stations on each island reporting is shown in first column.

TABLE 4.—*Results of simultaneous observations at two stations.*

[The location of each station is shown on the map, fig. 2.]

FOUNTAIN ESTATE, ST. KITTS.

[Elevation about 850 feet above sea level.]

Months.	Temperature.						Precipitation.	
	Monthly mean.		Highest (obs.).		Lowest.			
	8 a. m.	Minimum.		Date.		Date.	Amount.	No. days with .01 inch or more.
1900.	°	°	°		°		*Inches.*	
February	75.4	67.8	80	26	65	15	0.79	5
March	74.7	67.4	82	30	64	23	2.12	15
April	77.0[a]	68.7[a]	85	1, 24	64	7	4.98	20
May	79.1[a]	71.2[a]	84	12	70	5	1.28	11

UNITED STATES WEATHER BUREAU, ST. KITTS.

[Elevation 29 feet above sea level.]

February	78.2	73.5	80	26	70	28	0.15	2
March	77.4	72.7	83	30	69	12	1.04	5
April	78.2	73.0	86	28	68	19	2.64	18
May	80.8	75.2	82	3	68	14	0.42	7

[a] One observation missing.

TABLE 5.—*Results of meteorological observations.*

Time.	Estimated elevation.	Barometer (actual).	Thermometer.		Relative humidity.	Remarks.
			Dry.	Wet.		
	Feet.	*Inches.*	°	°		
8:30 a. m.	1,000	29.02	74.2	69.5	79	Open pasture; sun shining.
9:00 a. m.	1,500	28.52	68.0	67.0	95	Under a tree; cloudy.
9:30 a. m.	2,000	27.86	66.0	.....	.....	In the forest; sun shining.
10:20 a. m.	2,740	27.17	63.8	63.0	97	Lip of crater; low forest; overcast.
11:00 a. m.	2,150	27.75	65.0	65.0	100	Open land; bottom of crater; rained immediately after.
1:05 p. m.	3,100	26.75	.....	.....	.....	Lip of crater under the peak.

This table presents the results of meteorological observations made by Drs Christian and Edmond Braush and Mr. George King on April 22, 1900, while exploring the crater of Mount Misery. The barometer used was an aneroid and was set the day before to read with the barograph at this station. The thermometers were supplied from this office.

NOTES ON LOCAL WHIRLWINDS IN NEW BRUNSWICK.

By SAMUEL W. KAIN.

The province of New Brunswick is very rarely visited by violent storms, and the undesirable phenomena due to atmospheric disturbances have been recorded only at long intervals.

The tornadoes and cloudbursts which are reported so often from the west and south are happily almost unknown here.

Still it must not be forgotten that we have had such storms. On August 17, 1898, a tornado of considerable violence swept over the parish of Dumfries, York County, and in the United States WEATHER REVIEW for March, 1898, I have described a cloudburst observed near Sussex on August 1, 1897.

It may therefore be of some interest to briefly describe a small whirlwind observed at 4 p. m. on the 24th of May, 1900, by Mr. Keith A. Barber. While Mr. Barber was standing by the side of a pool of water about six miles from Clarendon

Station, Charlotte County, he heard in the distance a shrieking, whistling sound; this continued to increase in intensity, and turning to seek a cause he noticed a whirlwind advancing from the hills, its course indicated by the swaying shrubs and a noise somewhat like that produced by a express train, but not so loud. It struck the pool about three feet from the shore, and raised the water in a foaming mass of froth and spume to a height of 5 feet, and crossing threw the water upon the farther shore. Its path across the pool was about 15 feet wide. Mr. Barber was standing about one hundred feet from the path of the whirlwind. The sky was clear all day. In the morning there were a few light clouds, but after 2 p. m. the sky was cloudless.

The wind was northeast till noon, then shifted to southwest and south. It was light all day. The barometer was steady; at 8 a. m., 30.081; at 2 p. m., 30.129; at 8 p. m., 30.185. In St. John the highest temperature was 65° F., but at Clarendon the temperature was probably about 5° higher, the preceding days had been cold, and the change in temperature was considerable and rapid.

A very similar phenomenon was observed on Wednesday, June 14, at Grassy Lake, Kings County.

Dr. Colter, post office inspector, and Mr. Richard Magee, of the railway mail service, were fishing from a moored boat on the lake. It was a fine, clear day, and a good breeze was blowing when about 2 o'clock in the afternoon they heard a roaring in the woods, and with a rushing noise a few hundred feet from them the water of the lake commingled with reeds, lillies, and mud was torn up and hurled into the air, forming a waterspout apparently about 30 feet in diameter.

It lasted about two minutes, and for about that time the air seemed somewhat darkened. The violence of the wind drew their boat from its moorings in among the reeds, and it was fortunate that they were far enough from the path of the whirlwind to escape any more serious results.

LIGHTNING FROM A CLOUDLESS SKY.

By CHARLES E. ASHCRAFT, JR., Weather Bureau, Roseau, Dominica, W. I., dated November 14, 1900.

The phenomenon of lightning from a cloudless sky seems to be regarded in the States as one of very rare occurrence, as it very likely is. I can not remember of ever observing it while in the States, but down here in the West Indies it is of very frequent occurrence, so frequent in fact that it is not regarded as remarkable by the people. When first I saw this phenomenon after arriving in the tropics it caused me considerable wonder, and I was also in doubt as to whether it was real lightning or not. So I made inquiries among the residents and found to my surprise that it occasioned no wonder to them, and they evidently failed to understand why it should to me. Subsequently I have observed it numerous times, till finally the novelty has worn off, and I, like the residents, accept it now as only an ordinary occurrence. However, I believe this letter is justified, inasmuch as the phenomenon is rare in the States and any information relating thereto may be welcome.

The appearance of the flash is that of sheet lightning, generally single flashes being seen at intervals of from two to five minutes, and again only two or three occasional flashes will be seen during an evening. They do not seem to be confined to any particular quarter of the sky for local reasons, as I have observed them in all quarters. I do not think flashes are due to falling meteors, but they may be the reflected flashes of distant thunderstorms, although a clear sky certainly does not offer so good a reflecting surface as a clouded one. However, I am inclined to believe that the theory of the exchange of electricities between vertical currents of air is a very plausible explanation for the following reasons: In the first place the phenomenon has *always* been observed in the evening, usually between 7 and 9 p. m., never before 7, I believe, but several times after 9 o'clock. As this latitude is free from the disturbing effects of ever-passing areas of high and low pressure, the diurnal phases of the weather are therefore very constant and much alike from day to day. So that ordinarily between 7 and 9 p. m. the temperature falls, cool breezes spring up, a rapid clearing condition sets in, the clouds disappearing sometimes like magic, and by 9 p. m. the sky is usually clear. Now, it is always at this time when the colder currents of air are descending, causing the cool breezes and clearing condition and setting up a vertical circulation with steep gradients, that the lightning is seen. Sometimes the sky is not absolutely clear, a few clouds nearly always hanging over the mountains to the east of station, but the lightning will be seen far out to sea, perhaps, to the westward, where not the least vestige of cloud is visible. Then it is about this time in the evening that the maximum electrification of the air occurs, and in view of the fact that the lightning always occurs at the one time, is it not probable that the exchange of electricities between the descending and ascending currents having different temperatures and humidities, and therefore different electrical potentials, is the cause thereof.

I may add that these lightning flashes have been observed more frequently during the hurricane season, but just what weather conditions prevailed on the dates of occurrence I am unable to say, as I failed to make note of the dates. Furthermore, the phenomenon can not be peculiar to the region of Dominica alone, as I have talked to a number of persons who have lived long in tropical parts, and they are all agreed that lightning from a clear sky is no uncommon thing. By way of suggestion it might be worth while to question the observers of the West Indian and other tropical stations on the matter, and in this way considerable information might be adduced.

MEXICAN CLIMATOLOGICAL DATA.

Through the kind cooperation of Señor Manuel E. Pastrana Director of the Central Meteorologic-Magnetic Observatory the monthly summaries of Mexican data are now communicated in manuscript, in advance of their publication in the Boletin Mensual. An abstract, translated into English measures, is here given, in continuation of the similar tables published in the MONTHLY WEATHER REVIEW since 1896. The barometric means have not been reduced to standard gravity, but this correction will be given at some future date when the pressures are published on our Chart IV.

Mexican data for November, 1900.

Stations.	Altitude.	Mean barometer.	Temperature.			Relative humidity.	Precipitation.	Prevailing direction.	
			Max.	Min.	Mean.			Wind.	Cloud.
	Feet.	*Inch.*	° *F.*	° *F.*	° *F.*	%	*Inch.*		
Leon (Guanajuato)...	5,934	24.35	79.3	37.6	60.8	59	1.01	n.	e.
Mazatlan	25	29.93	85.8	68.4	77.2	74	.....	nw.	nw.
Mexico (Obs. Cent.)..	7,472	23.10	74.3	40.1	57.0	57	0.32	n.	ne.
Morelia (Seminario)..	6,401	24.02	74.8	42.8	57.7	67	1.28	w.	w.
Puebla (Col Cat.)....	7,112	23.43	76.8	39.0	60.8	65	0.59	e.	w.
Puebla (Col. d'E.)....	7,116	23.34	78.4	45.3	63.1	64	0.71	ene.	sw.
Saltillo (Col. S. Juan).	5,399	24.84	78.8	39.2	56.8	81	1.65	ne.	n.
San Luis Potosi.....	6,902	24.15	78.8	40.5	58.8	67	1.44	e.	e.
Tampico.....	38	30.08	86.0	52.2	71.6	72	0.38	se.	.....

OBSERVATIONS AT HONOLULU.

Through the kind cooperation of Mr. Curtis J. Lyons, Meteorologist to the Government Survey, the monthly report of meteorological conditions at Honolulu is now made partly in